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ABSTRACT

Two studies examined the interaction of regular classroom teachers with nonhandicapped high achievers, nonhandicapped low achievers, and mildly handicapped third and fourth graders. In both studies, teacher-student interaction was defined by using dependent measures derived from the Brophy-Good Teacher-Child Dyadic Interaction System. Multivariate and variate analysis of variance procedures demonstrated that, statistically, the groups were significantly different on 8 of 16 dependent measures in Study 1 and 7 of 16 measures in Study 2. Five of the differences found were the same for both studies. It was concluded that, although there is substantial evidence that teacher-student interaction varies among the student groups observed, there is no strong evidence that general preferential treatment (i.e., treatment likely to result in better educational gains or a more effective learning environment) is consistently provided to any single group of students. There was some evidence that mainstreamed handicapped children received a larger portion of the teacher's time; however, a larger percentage of these interactions concerned behavior rather than academics. Teaches provided larger percentages of neutral feedback in academic situations and disapproving feedback in behavioral situations to all student groups. Teachers engaged in academic interaction with all student groups an average of only 60 percent of the time. Results of both studies indicate a need for teachers in mainstreamed classrooms to devote more time to academic tasks, to provide more appropriate feedback to all students, and to use better classroom management techniques. (Author/CL)

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# Teacher-Student Interaction Patterns Within the Learning Environment of Mainstreamed Classrooms

by

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ABSTRACT

Regular classroom teachers were observed as they interacted with (1) nonhandicapped high achievers, (2) nonhandicapped low achievers, and (3) mildly handicapped students in two studies. In the first study, 12 third grade mainstreamed classrooms in two Utah cities were observed for eight one-day sessions. Twenty-one mainstreamed classrooms (12 third grade and 9 fourth grade) in South Dakota and Iowa were observed for 4 one-day sessions in the second study. In both studies, teacher-student interaction was defined by using the dependent measures derived from the Brophy-Good Teacher-Child Dyadic Interaction System. Multivariate and variate analysis of variance procedures demonstrated that, statistically, the groups were significantly different on 8 of the 16 dependent measures in the Utah study and 7 of 16 dependent measures in the South Dakota/Iowa study. Five of the differences found were the same for both studies. The overall conclusion of the two studies is that, although there is substantial evidence that teacher-student interaction varies among the student groups observed, there is no strong evidence that general preferential treatment (i.e., treatment likely to result in better educational gains or a more effective learning environment) is consistently provided to any single group of students. There was some

evidence that mainstreamed handicapped children received a larger portion of the teacher's time; however, a larger percentage of these interactions were concerning behavior rather than academics. Teachers provided larger percentages of neutral feedback in academic situations and disapproving feedback in behavioral situations to all student groups. Teachers engaged in academic interaction with all student groups an average of only 60% of the time. The results of both studies indicate a need for teachers in mainstreamed classrooms to devote more time to academic tasks, to provide more appropriate feedback to all students, and to use better classroom management techniques.

# Teacher-Student Interaction Patterns Within the Learning Environment of Mainstreamed Classrooms

## INTRODUCTION

The social concept of mainstreaming (i.e., educating handicapped children in the regular classroom) and the legal mandate of least restrictive environment (i.e., educating handicapped children to the maximum extent appropriate with children who are not handicapped) have led to widespread changes in our nation's schools. For many mildly handicapped students (i.e., educable mentally retarded, mildly emotionally handicapped, and learning disabled), the regular classroom is seen as the least restrictive environment. The concern, now, is not whether to mainstream but how to mainstream effectively and appropriately.

Criteria for defining the regular classroom as the least restrictive environment have been proposed by Heron and Skinner (1981). They consist of educational settings which (1) maximize the handicapped students' opportunity to respond and achieve, (2) permit the regular teacher to interact proportionally with all the students in the classroom, and (3) foster acceptable social relations between nonhandicapped and handicapped students. Such an environment would allow for the programming of the handicapped child's individual needs while not jeopardizing the progress of other students.

Ultimately, the success of educating handicapped children in the regular classroom will be largely dependent upon the regular

classroom teacher's attitudes and skills and the support she receives. To date, only a few studies have been conducted on teacher-student interaction in mainstreamed classrooms. Questions which remain largely unanswered include: Do both non-handicapped and handicapped students receive equal opportunities to respond?, Do they receive equal amounts of feedback from the teacher?, and Do both have adequate opportunities to learn or do handicapped children learn at the expense of the other students in the class?

The purpose of this paper is to report the results of a study conducted in South Dakota and Iowa designed to answer some of these questions and to compare the results to an earlier study conducted in Utah (Thompson, White, & Morgan, 1982).

## REVIEW OF LITERATURE

### Regular Elementary Classroom

The ability level of the student is one of the variables that affect the quantity and quality of teacher-student interaction in the regular classroom (Brophy & Good, 1974). Several researchers have reported that high achieving students receive more praise and teacher support than low achieving students (Brophy & Good, 1970; deGroat & Thompson, 1949; Hoehn, 1954; Horn, 1914). Some research suggests that teachers treat high achieving students in ways likely to ensure continued success and treat low achieving students in ways likely to slow their progress. For example, Rowe (1969) found that teachers would wait longer for an

answer from high achieving students than from low achieving students. Brophy and Good (1970) found that teachers were more likely to give high achieving students a second chance to respond to failure situations as well as receive more frequent praise for success and less frequent criticism for failure than low achieving students. High achieving students received more opportunities to respond and higher amounts of teacher praise according to Carne and Bing (1973), while low achievers received more negative teacher contacts and were involved in more discipline interactions. Observations by Kranz, Weber, and Fishell (1970) produced similar results. They reported that teachers consistently had more "substantive" interactions (academic as opposed to procedural or behavioral contacts) with the top third of their class.

Overall, researchers have found teacher-student interaction to occur disproportionately in the classroom (Brophy & Good, 1974); and, often, it is the high achieving student that seems to be favored. These results have important implications for mainstreaming handicapped students into regular classrooms. If handicapped children are treated in the same ways as low achievers, then the regular classroom environment may not be the least restrictive.

## Mainstreamed Classrooms

The limited studies which have examined how classroom teachers interact with handicapped students in the regular classroom situation often presents conflicting results. For example, Bryan

and Wheeler (1972) and Bryan (1974) found that the teacher initiated about the same number of interactions with the handicapped as compared to nonhandicapped students. However, Wherry and Quay (1969), Forness and Esveldt (1975), and Chapman (1975) found that the number of interactions with handicapped students were more frequent than with nonhandicapped students. The results of studies by Fink (1977), Bryan and Wheeler (1972), and Bryan (1974) all showed that teacher-handicapped student interactions tended to be negative in nature. Chapman (1975), on the other hand, found that handicapped students received more preferential treatment in some situations

## Design Limitations

In addition to conflicting findings, the research evidence presented above is further clouded by fundamental weaknesses in the research designs or statistical procedures employed. Small student samples, limited observational data, and the analysis of multiple dependent measures without first using Multivariate Analysis Procedures (MVA) are examples of such problems.

## Utah Study

In an effort to add clarification and overcome some of the methodological problems, a study conducted by Thompson, White, and Morgan (1982) to systematically observe elementary teachers as they interacted with mainstreamed handicapped students, nonhandicapped high achievers, and nonhandicapped low achievers used

a large sample, multiple measures, and MVA techniques to analyze the data. Specifically, the study used a modified version of the Teacher-Child Dyadic Interaction System (Brophy and Good, 1969) to observe teacher-student interaction patterns in 12 third grade mainstreamed classrooms in two northern Utah cities. A total of 129 students in the following four groups were observed: (1) nonhandicapped high achievers, (2) nonhandicapped low achievers, (3) learning disabled, and (4) behaviorally handicapped. A multivariate analysis of variance (MANOVA) procedure was used to overcome the problem of multiple dependent measures. The large number of students observed (in comparison to similar research) and the fact that the study was run for eight days (one day a week for eight weeks) also helped to overcome some of the earlier studies' methodological problems.

The overall conclusion of the study was that there were significant differences in teacher-student interaction patterns among the four student groups. Some of the data suggested that teachers provided preferential treatment to mildly handicapped students in some situations (e.g., higher amounts of sustaining feedback to behaviorally handicapped students); however, there was also some data that indicated that teachers provided preferential treatment to high achievers in some situations (e.g., higher amounts of praise to highs). There was further evidence that behaviorally handicapped students took a large amount of the teacher's time and a disproportionate percentage of that time was spent in behavioral interactions.

Teachers tended to treat all students about the same when interactions involved academic and procedural matters. They generally did not provide positive reinforcement nor did they criticize. They were overwhelmingly neutral in providing feedback to the students. When teachers interacted about behavioral matters, they used a majority of warnings for all student groups. Only a small percentage of their feedback was praise or criticism. The majority of both teacher and student initiations were academic as opposed to procedural (i.e., initiations involving nonacademic activities).

The results of this study did not support the view that handicapped children who are being mainstreamed into regular education classrooms will be at a severe disadvantage because of preferential teacher interactions provided to nonhandicapped students. However, the results did indicate that more effective learning environments need to be designed for all students. Regular classroom teachers need to increase the proportion of positive feedback and decrease neutral and disapproving feedback and also achieve a better balance between academic and procedural activities.

## SOUTH DAKOTA/IOWA STUDY

The purpose of the South Dakota/Iowa (SD/I) study was to provide additional descriptive data about teacher-student interaction patterns in mainstreamed classrooms and add generality to the findings discussed above.

The number of classrooms observed in the SD/I study was expanded to twenty-one as compared to twelve in the Utah study. The number of observation days was reduced from eight to four. In the Utah study, 480 hours of data were collected while in the SD/I study, 420 hours of data were collected. The handicapped target students observed in the SD/I study were left as one group called mildly handicapped and not separated out by handicapping conditions as in the Utah study. In both studies, teacher-student interaction was defined as a composite of 16 dependent measures derived from the 54 Brophy-Good categories. The six research questions used in the Utah study were again addressed in the SD/I study to determine if teacher-student interaction patterns were different for student groups. Table I presents the six research questions and the corresponding dependent measures.

## METHOD

### Sample

Thirty third- and fourth-grade teachers in South Dakota and Iowa were asked to participate in the study. Twelve third- and nine fourth- grade teachers volunteered and were observed for the full length of the study. All were females and their average teaching experience was 16 years. Each teacher taught in a traditional self-contained classroom and had two, three, or four mildly handicapped students mainstreamed in her classroom. Mildly handicapped children are identified as "students in need of special assistance" in South Dakota and as educable mentally

Table I

Research Questions and Dependent Measures

| Research Questions | Dependent Measures |
|---|---|
| 1. Is there a difference in teacher-initiated interactions to students? | 1. Frequency of Teacher Initiations<br>2. Proportion of teacher initiations initiations which are academic<br>3. Proportion of teacher initiations which are procedural<br>4. Proportion of teacher initiations which are behavioral |
| 2. Is there a difference in student-initiated interactions to teachers? | 5. Frequency of teacher initiations<br>6. Proportion of student initiations which are procedural as opposed to academic |
| 3. Is there a difference in the type of teacher feedback given to students? | 7. Frequency of teacher feedback<br>8. Proportion of teacher feedback which is academic<br>9. Proportion of teacher feedback which is procedural<br>10. Proportion of teacher feedback which is behavioral<br>11. Proportion of teacher feedback which is sustaining as opposed to terminal |
| 4. Is there a difference in the quality of teacher feedback given to students? | 12. Quality of academic teacher feedback (i.e., praise, neutral, criticism)<br>13. Quality of procedural teacher feedback (i.e., praise, neutral, criticism)<br>14. Quality of behavioral teacher feedback (i.e., praise, warnings, criticism) |
| 5. Is there a difference in the type of response opportunities provided to students by the teacher? | 15. Proportion of response opportunities which are volunteer as opposed to nonvolunteer |
| 6. Is there a difference in the type of question asked of the students by by the teacher? | 16. Quality of questions asked by the teacher (i.e., process, product, choice, self-reference) |

retarded, mildly emotionally handicapped, and learning disabled in Iowa. Each student had an IEP written and were receiving at least one half-hour of resource room help a day but no more than two hours per day.

All but two teachers had previously taught handicapped children in regular classrooms. Teachers were not informed about the specific purpose of the study nor of the nature of the data to be collected until after the study was completed. Teachers were asked to rank their classes on a five-point scale in terms of general academic achievement. The five levels were as follows: (1) lowest, (2) next-to-lowest, (3) average, (4) next-to-highest, and (5) highest. Teachers were told that they could use the most recent standardized achievement test scores as reference.

High-achieving and low-achieving target students were selected in numbers equal to the identified handicapped students in each class. For example, if a class had three identified handicapped students, then three students were identified as low achievers (i.e., students ranked 1) and three students were identified as high achievers (i.e., students ranked 5). Thus, a total of nine students were observed. A total of 58 high achievers, 58 low achievers, and 61 handicapped students (in one class there were 6 handicapped students but only 3 highs and 3 lows) were identified and observed. Of the twenty-one classrooms, five classes had four students in each of the three target groups, six classes had three in each target group, and ten classes had two students in each of the three target groups.

## Procedure

Each classroom was observed one day a week for a total of 5 weeks in the late winter and early spring. The first day was used for classroom training and adaptation time for both observers and subjects and for interobserver agreement checks. A total of 420 hours of observational data were collected and used in the final data analysis.

Eight graduate students from the University of South Dakota were trained according to procedures outlined by Coulter (1976). Each observer was provided with 40 to 50 hours of intensive training until a minimum of 80 percent of interobserver agreement was achieved. Training proceeded in three stages: written transcripts; videotapes; and, finally, real classrooms.

Interobserver agreement was calculated during each phase of the training using the procedure suggested by Coulter (1976, p. 19). Random pairs of observers coded together during the transcript (79% average agreement) and the videotapes (average agreement 81%) phases. During the training phase involving real classrooms, observers used one or more days to learn the target student and allow for adaptation of the teacher and students to the observer's presence. A final interobserver agreement check was made during this phase by having observers code for half an hour with each other in the training classroom. All pairs were at or above the required 80% level.

## Observation Instrument

Overview. Data were collected using a modified version of the Teacher-Child Dyadic Interaction System (Brophy and Good, 1969). This system focuses on interactions between the teacher and each student (i.e., teacher-student interactions are recorded and analyzed separately for each student), thus making the student rather than the class the unit for which data are collected (Brophy & Good, 1969). The system also preserves the sequential nature of teacher-student interactions in the coding process. Modification of the Brophy-Good system included dropping the reading-recitation coding sheet and adding a section for child-initiated response opportunities (i.e., student-initiated questions and comments in public situations). In addition, a section for coding teacher- or student-initiated personal comments (i.e., nonschool-related statements) was added. Because handicapped students periodically left the classroom for resource room help, it was also necessary to add a section where each individual student's observation period could be recorded.

Coding Sequence. The type of interaction was the first information coded during observation. Response opportunities were coded when the teacher was interacting with an individual student in a public situation, and dyadic contacts were coded for private situations. Second, the initiator of the interactions was coded. A distinction was made between teacher-initiated interactions and child-initiated interactions. Within teacher-initiated response

opportunities, the type of opportunity provided, the appropriateness of the child's response, and the teacher's feedback were recorded. The type of child-initiated response opportunity and the teacher feedback were recorded when the student made public comments or asked public questions. The major categories with teacher-initiated dyadic contact included work, procedural, observation, and behavioral interactions. Teacher feedback was also coded as praise, process, product, criticism, and/or warning. Within the child-initiated dyadic contacts, work and procedural interactions were coded as praise, process, product, or criticism. Interactions that were unrelated in any way to school interactions were recorded as either teacher-initiated or child-initiated personal contacts.

## Data Analysis

Raw data collected during the observation were converted into individual student scores for each of the 16 dependent measures of teacher-student interaction. These 16 dependent measures were derived by combining similar types of data from the 72 discrete variables about which the observation system yielded data. Frequency data were standardized by time.

A two-way mixed effects model multivariate analysis of variance (CLASSES with 21 levels were treated as a random effect and GROUPS with three levels were treated as a fixed effect) was computed using the computer program MANOVA (Clyde, 1969) with CLASSES as a blocking variable to increase the precision of the

analysis. Wilk's lambda criterion was used to test for equality of group centroids. The value calculated with the Wilk's lambda procedure was transformed into an F value through Rao's approximation (Cooley and Lohnes, 1962).

Because the test of lambda produced an F that was statistically significant ($p < .01$; df=2, 154), univariate ANOVA's were computed and the resulting F ratios for each dependent measure were examined to determine which measures contributed to the statistically significant MANOVA results. Newman-Keul's Multiple Range Comparison Tests (Winer, 1971) were computed for each dependent variable that yielded a statistically significant univariate F ($p < .05$) for the between GROUPS comparison.

## RESULTS

As depicted in Table II, the results of the univariate ANOVA's provided information about the dependent variables that were most important and contributed most substantially to the differences identified in the MANOVA. Also shown in Table II are the means and results of the Newman-Keul's multiple comparison tests computed for each dependent measure of teacher-student interaction that was statistically significant at the $p < .05$ level.

Table II reports only the ANOVA results for the main effect of GROUPS since the results were of primary importance in the study. Because intact classrooms were used, the responsibility of individual differences between classrooms could be removed

Table II

Means, Standard Deviations, ANOVA Results, and Neuman-Keuls Multiple Comparison Results for the 16 Dependent Variables Associated with the 6 Research Questions Utah-South Dakota/Iowa Studies

| Research Question | | Dependent Variable | Utah: Means[a] and Results of Relevant Neuman-Keuls Multiple Comparison Test[b] For Each Group on All 16 Dependent Measures | | | | Utah: F Test | South Dakota/Iowa: Means[a] and Results of Relevant Neuman-Keuls Multiple Comparison Test[b] For Each Group on All 16 Dependent Measures | | | South Dakota/Iowa: F Test |
|---|---|---|---|---|---|---|---|---|---|---|---|
| I. Teacher Initiated Interactions[a] | 1. | Frequency of Teacher Interactions | 2.81 BH | 1.80 LD | 1.66 Lo | 1.38 Hi | 16.029 p <.01 | 2.48 Hd | 2.21 Lo | 1.90 Hi | 8.97 p <.01 |
| | 2. | Proportion of Teacher Initiations which are academic | 61.8% Hi | 58.3% LD | 57.3% Lo | 51.6% BH | 2.190 p >.10 | 69.4% Hi | 64.3% Hd | 63.4% Lo | 3.42 p <.05 |
| | 3. | Proportion of Teacher Initiations which are procedural | 15.0% Hi | 13.8% Lo | 11.5% LD | 11.3% BH | 2.618 p >.10 | 20.4% Hd | 19.4% Hi | 19.2% Lo | .36 p >.10 |
| | 4. | Proportion of Teacher Initiations which are behavioral | 37.1% BH | 28.8% Lo | 28.2% LD | 23.2% Hi | 4.019 p <.01 | 17.4% Lo | 15.3% Hd | 11.2% Hi | 5.04 p <.01 |
| II. Student Initiated Interactions[a] | 5. | Frequency of Student Initiations | 2.09 BH | 1.53 LD | 1.23 Lo | 1.10 Hi | 3.826 p <.05 | 1.81 Hi | 1.80 Lo | 1.61 Hd | 1.19 p >.10 |
| | 6. | Frequency of student initiations which are procedural (as opposed) to academic | 25.8% BH | 23.8% LD | 20.4% Lo | 19.6% Hi | 1.614 p >.10 | 22.4% | 21.5% | 20.9% | .08 p >.10 |
| III. Type of Feedback[a] | 7. | Frequency of Teacher Feedback | 4.36 BH | 2.80 LD | 2.34 Lo | 1.91 Hi | 13.738 p <.01 | 3.63 Lo | 3.37 Hd | 2.60 Hi | 4.04 p <.05 |
| | 8. | Proportion of Teacher Feedback which is academic | 69.8% Hi | 66.5% LD | 66.3% Lo | 61.3% BH | 2.336 p >.10 | 72.1% Hi | 69.5% Lo | 69.1% Hd | 1.08 p >.10 |
| | 9. | Proportion of Teacher Feedback which is procedural | 17.1% LD | 16.8% Hi | 16.7% BH | 16.2% Lo | .743 p >.10 | 20.6% Hi | 19.7% Hd | 18.7% Lo | .78 p >.10 |
| | 10. | Proportion of Teacher Feedback which is behavioral | 22.1% BH | 17.4% Lo | 16.4% LD | 13.4% Hi | 3.656 p <.05 | 11.8% Lo | 11.2% Hd | 7.3% Hi | 5.25 p <.01 |
| | 11. | Proportion of Teacher Feedback which is sustaining (as opposed to terminal) | 13.3% BH | 12.5% LD | 10.8% Lo | 6.7% Hi | 3.224 p <.05 | 12.6% Hd | 12.2% Lo | 10.3% Hi | .93 p >.10 |
| IV. Quality of Teacher Feedback[c] | 12. | Quality of Academic Feedback | 2.36 Hi | 2.33 Lo | 2.29 LD | 2.22 BH | 2.723 p <.05 | 2.31 Hi | 2.20 Hd | 2.18 Lo | 8.09 p <.01 |
| | 13. | Quality of Procedural Feedback | 1.99 BH | 1.94 LD | 1.91 Lo | 1.87 Hi | .319 p >.10 | 1.79 Lo | 1.74 Hi | 1.62 Hd | 1.18 p >.10 |
| | 14. | Quality of Behavioral Feedback | 2.27 Hi | 2.27 Lo | 2.13 LD | 2.05 BH | 1.409 p >.10 | 1.82 Lo | 1.82 Hd | 1.70 Hi | .52 p >.10 |
| V. Type of Response Opportunities | 15. | Proportion of Response Opportunities which are volunteer (as opposed to non-volunteer) | 65.1% Hi | 62.9% BH | 60.5% LD | 55.1% Lo | 2.117 p >.10 | 58.9% Hi | 38.4% Lo | 31% Hd | 18.75 p <.01 |
| VI. Type of questions[d] | 16. | Quality of Questions | 2.80 LD | 2.68 Lo | 2.61 Hi | 2.41 BH | 3.216 p <.05 | 2.87 Hi | 2.80 Hd | 2.70 Lo | 1.71 p >.10 |

[a] Dependent variables #1, #5, and #7 should be interpreted as the number of times per hour that particular activity occurs with each student observed. All other dependent measures in these categories are percentages of total time.

[b] Neuman-Keuls Multiple Comparison Tests were done only for those dependent variables for which there was a statistically significant difference between groups at the $\alpha = .05$ level. For dependent variables for which a Neuman-Keuls comparison was done, those groups underlined by a common line are not statistically significantly different; groups not underlined by a common line are statistically significantly different from each other. For example, on the dependent variable "Frequency of Teacher Initiations," in terms of statistical significance BH > LD, Lo, & Hi and LD > Hi; but the Null Hypotheses LD = Lo and Lo = Hi could not be rejected.

[c] Each time the teacher provided feedback to a student, it was coded as Criticism = 1; Warning/Neutral = 2; or praise = 3. Each student's score was the average number assigned across all instances of feedback for that student.

[d] Each time the teacher asked the student a question, it was coded as a Self-referant question = 1; Choice question = 2; Product question = 3; or Process question = 4. The score for a student was the average number assigned across all questions asked of that student.

from the estimates of GROUPS and error effects of blocking by CLASSES. The effect of blocking is to increase the precision of the study. The fact that there were statistically significant differences among classes for all of the 16 dependent variables indicates that this strategy was effective. Differences among classes in terms of how a teacher interacts with the students are expected and intuitively logical given the differences in teachers' styles, experiences, and personalities; but they were not the focus of the research reported in this paper. (Note: The results of the Utah study are also presented in Table II for direct comparison.)

## DISCUSSION AND COMPARISON

### Teacher-Initiated Interactions

One of the conditions set by Heron and Skinner (1981) for considering the regular classroom as the least restrictive environment is the extent to which the teacher interacts proportionately with all the students in the classroom. The results of the SD/I study indicate that handicapped children received more teacher initiations than either highs or lows in terms of absolute frequency, and that handicapped and lows both received significantly more initiations from the teacher than did highs. In the Utah study, behaviorally handicapped students received the most teacher initiations, while learning disabled and lows were the same and high achieving students received the smallest number of initiations from the teacher. The results of both studies

support Chapman (1975) who found that learning disordered students received more interactions than high or low achieving, non-handicapped students. Werry and Quay (1969), Martin (1972), and Forness and Esveldy (1975) found that students who had been identified as disruptive and aggressive received more total teacher initiations than their nonhandicapped peers.

The results of both studies must be considered in light of the time handicapped students spend in the regular classroom. For example, in the South Dakota study, high achievers were observed for an average of 15.95 hours, low achievers were observed for an average of 16.28 hours, and handicapped students were observed for an average of 12.98 hours. Similar proportions were seen in the Utah study. This means that even though the handicapped students were in the classroom less time, they received the most teacher initiations.

Heron and Skinner (1981) argue that each student in the mainstreamed classroom should receive a fair portion of the teacher's attention each day. The results found in both the South Dakota/Iowa and Utah studies would seem to indicate that handicapped students receive disproportionatly larger amounts of the teacher's time. What may be occurring in these classrooms is inappropriate reinforcement for the handicapped students' off-task behavior, or there may be an attempt by the regular classroom teacher to provide extra help to children they view as unable to cope academically, emotionally, or socially. These results do not support studies which found that teachers initiat-

ed more contacts and were involved with more interactions with high achievers than with low achievers (Good, 1970; Kranz, Weber, & Fishell, 1970; Carne & Bing, 1973)

Type of Teacher Initiation

In both the South Dakota/Iowa and Utah studies, teacher initiations were divided into three categories: Academic contacts (e.g., seatwork, homework, and question and answer sequences), procedural initations ("housekeeping" chores and other nonacademic activities), and behavioral initiations (e.g., teachers singled out a student to comment solely on his or her behavior). In the SD/I study, significant differences were found in the proportion of both academic and behavioral teacher initiations to the three student groups. Handicapped and low achievers received significantly less academic initiations and significantly more behavioral initiations than did high achievers. There were no significant differences in the proportion of procedural initiations to the three student groups. In the Utah study, no differences were found in academic or procedural initiations among the four groups observed in that study. Differences in the proportion of the behavioral teacher initiations to the behaviorally handicapped students and the high achievers were found. (Note: The data reported by Thompson et al. (1982) should have been reversed for variables three and four. The data reported as procedural teacher initiations were, in fact, behavioral teacher initiations and vice-versa.)

By examining the percentage of teacher initiations to the three student groups in the SD/I study (see Table IIIb), it can be seen that high achievers got the most academic and the least behavior initiations while low achievers got the least academic and the most behavioral. This same pattern can be seen in the Utah data (see Table IIIa). Low achievers and handicapped students seem to be treated in similar ways by the teacher in terms of the number and type of initiations she makes to them in both studies.

Student-Initiated Interactions

Neither the frequency nor the type of student initiations differed among the three groups of students observed in the SD/I study. These results are quite different from those found in the Utah study where behaviorally handicapped students initiated almost twice as many interactions with the teacher as did their high-achieving, nonhandicapped peers. In the South Dakota study, no distinction was made between the kind of handicapping condition; and this change may account for not seeing any differences in student initiations among the student groups in the SD/I study.

The proportion of student initiations from all student groups was an average of 22% procedural and 78% academic. In the Utah study approximately the same proportions were found. (Note: The data reported by Thompson et al. (1982) should have been reversed for variable 6. The data reported as procedural student initiations should have been academic student initiations.)

Table IIIa

Utah Study

Proportion of Teacher Initiations Which Are Academic, Procedural, and Behavioral

| Dependent Measure | Student Group Highs | Lows | LD | BH |
|---|---|---|---|---|
| Teacher Initiations Academic | 62% | 57% | 58% | 52% |
| Teacher Initiations Procedural | 15% | 14% | 14% | 11% |
| Teacher Initiations Behavioral | 23% | 29% | 28% | 37% |

Table IIIb

South Dakota/Iowa Study

Proportion of Teacher Initiations Which Are Academic, Procedural, and Behavioral

| Dependent Measure | Student Group Highs | Lows | Handicapped |
|---|---|---|---|
| Teacher Initiations Academic | 69% | 63% | 64% |
| Teacher Initiations Procedural | 19% | 19% | 20% |
| Teacher Initiations Behavioral | 11% | 17% | 15% |

When the correction is made in the Utah data, the data from both studies indicate that, on the average, all student groups sought out the teacher for academic help three to four times as often as they initiated procedural interactions.

## Frequency of Teacher Feedback

The overall frequency of teacher feedback in the SD/I study was highest for low achievers with the handicapped students receiving the next largest amount. The high achievers received a statistically significant smaller amount of feedback than lows and handicapped students. The proportion of academic (an average of 70%) and procedural (an average of 20%) feedback statistically was not significant among the student groups. The proportion of behavioral feedback, however, was higher for lows (11.8%) and handicapped (11.2%) than for highs (7.5%). In the Utah study, there was no difference between the high, low, or learning disabled in either total feedback or behavioral feedback. However, the behaviorally handicapped students received higher amounts of total feedback and behavioral feedback.

It seems that the breaking of handicapped students into categories in the Utah study might have provided a more sensitive measure. The behaviorally handicapped students were the ones most often treated in different ways. In the South Dakota/Iowa study, the handicapped students and the low achievers seem to be treated as the same group and different from high achievers in all cases where group differences were found.

In contrast to the Utah study, no statistically significant differences were found in the SD/I study among the groups in the proportion of teacher feedback that was sustaining (i.e., designed to continue the interaction) as opposed to terminal (i.e., designed to end the interaction). Tables IVa and IVb provide a

comparison. In the Utah study, behaviorally handicapped students received significantly more sustaining feedbacks (13.3%) than did high-achieving, nonhandicapped students (6.7%). In other words, teachers were more apt to provide behaviorally handicapped students with a clue, rephrase the question, or ask additional questions in order to sustain the interaction. In the SD/I study, the handicapped students and the low-achieving, nonhandicapped students received more sustaining feedback (12.6% and 12.2%) than the high achievers (10.3%); however, the difference was not statistically significant. The findings of both studies seem to contradict the findings of Brophy and Good (1970), who reported that teachers were twice as likely to stay with high-achieving students and give up on low-achieving students.

It is important to note that in both the Utah and South Dakota/Iowa studies that the majority of teacher feedback for all students was terminal (See Tables IVa and IVb). Chapman (1975) reported similar results in that teachers provided very little sustaining feedback to any of the groups observed. In a study by Massad and Etsil (1972), a significant increase in learning was achieved in situations where students were given more opportunities to respond. Heron and Skinner (1981) have stated that one condition for considering the regular classroom to be the least restrictive environment for handicapped students is an educational setting which maximizes the handicapped child's opportunity to respond and achieve. The data from both studies may indicate that many teachers frequently do not use the higher level skills

Table IVa

Utah Study

Proportion of Teacher Feedback
Sustaining vs. Terminal

| Teacher Feedback | Student Groups BH | LD | Low | High |
|---|---|---|---|---|
| Sustaining | 13.3% | 12.5% | 10.8% | 6.7% |
| Terminal | 86.7% | 87.5% | 89.2% | 93.3% |

Table IVb

South Dakota/Iowa Study

Proportion of Teacher Feedback
Sustaining vs. Terminal

| Teacher Feedback | Student Groups HD | Low | High |
|---|---|---|---|
| Sustaining | 12.6% | 12.2% | 10.3% |
| Terminal | 87.4% | 87.8% | 89.7% |

required in interactive teaching. In such learning environments, it is questionable that handicapped students will have enough opportunities to respond to maximize learning.

Quality of Teacher Feedback

In addition to examining the total frequency of teacher feedback and the proportions of academic, procedural, and behavioral feedback given by the teacher, an attempt to examine the quality of teacher feedback was made in both studies. The quality of feedback provided to students in each of the student groups is particularly important because of the hypothesis that certain types of feedback (e.g., praise, encouragement, affection) result in more effective and growth-promoting learning environments than other types of feedback (e.g., criticism, ridicule, reinforcing inappropriate behaviors). Each instance of the teacher's academic and procedural feedback was coded as praise, neutral, or criticism; and each instance of behavioral feedback was coded as praise, warning, and criticism. In the SD/I study, statistically significant differences were found in the quality of academic feedback (handicapped and lows received a lower quality than did high achievers), but no differences among the groups were found in the quality of procedural and behavioral feedback. As with other dependent measures, the results of the Utah study were generally similar except the differences were between high achievers and behaviorally handicapped students.

Additional descriptive information about the nature of academic, procedural, and behavioral feedback can be gained by examining the percentages of teacher feedback given to each group. In both studies (See Tables Va and Vb), students in all groups received substantially more neutral academic and procedural feed-

Table Va

Utah Study

Percentages of Teacher Feedback Given to Each Group of Students Involving Praise, Neutral Warning, and Criticism

| Measure | High Achieving | Low Achieving | LD | BH |
|---|---|---|---|---|
| Academic Feedback | | | | |
| Praise | 20% | 18% | 16% | 13% |
| Neutral | 76% | 79% | 81% | 84% |
| Criticism | 4% | 3% | 3% | 5% |
| Procedural Feedback | | | | |
| Praise | 4% | 2% | 1% | 1% |
| Neutral | 94% | 96% | 96% | 95% |
| Criticism | 2% | 2% | 3% | 4% |
| Behavioral Feedback | | | | |
| Praise | 22% | 15% | 10% | 5% |
| Warning | 73% | 80% | 86% | 87% |
| Criticism | 3% | 5% | 4% | 8% |

Table Vb

South Dakota/Iowa Study

Percentages of Teacher Feedback Given to Each Group of Students Involving Praise, Neutral Warning, and Criticism

| Measure | High Achieving | Low Achieving | HD |
|---|---|---|---|
| Academic Feedback | | | |
| Praise | 21% | 18% | 21% |
| Neutral | 76% | 78% | 73% |
| Criticism | 3% | 8% | 6% |
| Procedural Feedback | | | |
| Praise | 1.5% | 1% | 1% |
| Neutral | 97% | 94% | 97% |
| Criticism | 1.5% | 5% | 2% |
| Behavioral Feedback | | | |
| Praise | 7% | 4% | 6% |
| Warning | 79% | 72% | 74% |
| Criticism | 14% | 24% | 20% |

back and warnings of behavioral feedback than either praise White (1975) defined disapproval using the same elements that are contained in the behavioral warning and behavioral criticism codes used in both the studies described here, and he similarly found that teachers were far more disapproving of students than approving.

The large proportion of disapproval (i.e., warning plus criticism) observed in both the Utah and SD/I studies does not indicate an effective learning environment was being provided. Researchers have shown that a positive environment where frequent praise is given for appropriate behavior is much more conducive to student achievement than an environment where disapproval is the primary feedback (Brophy & Evertson, 1976). Rosenshine, (1976) has shown that students with low self-esteem and a history of failure require much more encouragement and are particularly vulnerable to criticism. In contrast, the students who have high self-esteen and a history of success did not find praise nearly as rewarding or motivating. Teachers in both the Utah and SD/I studies tended to provide feedback in ways that are contrary to what would seem effective for either group.

## Frequency of Volunteer Response Opportunities

Another variable investigated was whether teachers provided the most opportunities for participation to students who were not volunteering (i.e., called upon when hands were not raised), as opposed to those who were volunteering (i.e., called upon after

raising their hands). In the SD/1 study, a significant difference was found between the high-achieving, nonhandicapped students (59% volunteer) and both the low-achieving, nonhandicapped students (38% volunteer) and handicapped students (31% volunteer). Teachers seem to seek out nonvolunteers in the handicapped and low-achieving student groups in order to engage them in classroom discussions. This would seem to be a positive finding indicating an attempt on the teacher's part to increase participation. No significant differences were found in the Utah study. The average for all student groups was about 60% volunteer response opportunities.

## Quality of Questions

Teacher's questions to students were coded as process, product, choice, or self-reference in both studies. Generally, these four types of questions can be viewed on a continuum of difficulty from more demanding to less demanding in terms of the knowledge required of the student to answer. Previous research has reported that high-achieving students generally receive more higher-level questions than low-achieving students (Brophy & Good, 1974). In the SD/I study, no significant differences were found among the three student groups. Total scores for all groups in both studies indicate that, on the average, teachers used mostly lower-level questions. Very few process questions and only a moderate number of product questions were asked of any group of students.

This finding, however, may not be as negative as it first appears. Rosenshine (1976) reviewed several studies that indicated a positive correlation between achievement and factual single-answer questions, whereas the frequency of more complex questions (such as the process questions in these studies) had negative correlations. Particularly for low-achieving and mildly handicapped students, it may be preferable to proceed in small steps, asking factual questions instead of expecting the child to engage in complex reasoning at too early a stage in their educational growth.

## CONCLUSIONS

In discussing mainstreaming, Larsen (1975) warned:

> In all probability, special education students will receive more criticism from their teachers than their achieving peers, will be exposed to far fewer teacher contacts, and will develop less positive concepts of self-worth (p. 12).

The literature examining how teachers interact with high and low achieving students provides some evidence to suggest that Larsen's warning may be accurate if mainstreamed handicapped students were treated like low achievers. Findings of studies examining the interaction of regular teacher and handicapped students, however, are not conclusive and provide evidence both supporting and refuting Larsen's warning.

The overall conclusion of both the Utah and SD/I studies is that, although there is substantial evidence that teacher-student interaction varies among the student groups observed, there is no

strong evidence that general preferential treatment or treatment likely to result in better educational gains or a more effective learning environment is consistently provided to any single group of students. There was some evidence that mainstreamed handicapped received a larger portion of the teacher's time than did other students. However, a larger percentage of these initiations were behavioral contacts.

Teacher feedback was, for the most part, neutral to all students when the feedback was about academic or procedural matters. In behavioral interactions, warnings were the primary teacher feedback. When criticism was used, it was more often to the low-achieving and handicapped students. These results suggest that teachers need to acquire better classroom and behavior management skills. Teachers will need to use a behavioral management strategy where the behavior of every student is dealt with in an appropriate way.

Teachers were engaged in academic interactions with all student groups an average of only 60% of the time. It is unfortunate that such a high percentage of the teacher's time was spent involved with procedural and behavioral matters. A better balance between academic and other activities should be achieved.

Placement of handicapped students in the regular classroom is increasingly popular. Such decisions are often based upon the student's academic or social functioning. While these student variables are important, there are also teacher and classroom variables which must be considered in defining the least restric-

tive environment for mildly handicapped students. Helping teachers increase their skills in classroom management and the use of school time spent on academics and more proportionate teacher-student interaction would lead to a better learning environment for all students.

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